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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/777,606  | 02/12/2004  | Richard Henry Pohle  | MAUI03-02           | 4631             |
| 7590  | 03/22/2005  |                      | EXAMINER            |                  |
| Gregory Matthew McCloskey<br>Textron Systems Corporation<br>201 Lowell Street<br>Wilmington, MA 01887 |             |                      | HASAN, MOHAMMED A   |                  |
|   |             |                      | ART UNIT            | PAPER NUMBER     |
|   |             |                      |                     | 2873             |

DATE MAILED: 03/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                        |                      |  |
|------------------------------|------------------------|----------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b>  |  |
|                              | 10/777,606             | POHLE, RICHARD HENRY |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>      |  |
|                              | Mohammed Hasan         | 2873                 |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on preliminary amendment filed on 8/27/04.
- 2a) This action is FINAL.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1 - 45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 42 - 45 is/are allowed.
- 6) Claim(s) 1- 11, 16, 17, 19 - 21, 35, 36, 42 - 45 is/are rejected.
- 7) Claim(s) 12 - 15, 18, 22- 34, 37 - 41 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 27 August 2004 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____.   |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/12/2004</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____.                                   |

## **DETAILED ACTION**

### ***Oath/Declaration***

1. Oath and declaration filed on 2/12/2004 is accepted.

### ***Information Disclosure Statement***

2. The prior art documents submitted by applicant in the Information Disclosure Statement filed on 2/12/2004 have all been considered and made of record (note the attached copy of form PTO – 1449).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 – 11, 16, 17, 19 – 21, 35, and 36 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Kiunke et al (5,363,235) in view of Cooper (5,936,771).

Regarding claim 1, Kiunke et al discloses (refer to figures 1 - 3) an imaging system (10) comprising: a primary mirror (20) and a primary mirror has a diameter, a

secondary mirror (22) configured to received light reflected from the primary mirror, a first fold mirror (26) configured to receive light from a secondary mirror (22) and a second fold mirror (28) configured to receive light from a first fold mirror (26), wherein a field of view (FOV) is imaged (column 2, lines 50 – 68, column 3, lines 1 – 16, column 11, lines 31 - 40). Kiunke et al discloses all of the claimed limitations except a spherical housing and a primary mirror has a diameter that is smaller than an interior diameter of spherical housing. However, Cooper discloses (refer to figure 1) a spherical housing (1) (column 3, lines 19 – 25) and further discloses a spherical housing (1) is 16.67 inches in diameter (column 5, lines 20 – 22, i.e., a circular shape spherical housing and an image system inside the spherical housing).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a spherical housing (1) with the larger diameter in to the Kiunke an imaging system for the purpose of minimizes the size and weight and to achieve a high resolution with a larger diameter aperture as taught by Cooper (column 1, lines 60 – 65).

Regarding claim 2, Kiunke et al discloses (refer to figure 1) wherein a primary mirror (20) is concave (column 2, lines 66 – 68).

Regarding claim 3, Kiunke et al discloses (refer to figure 1) wherein a primary mirror (20) is parabolic.

Regarding claim 4, Kiunke et al discloses (refer to figure 1) wherein a primary mirror (20) is hyperbolic.

Regarding claim 5, Kiunke et al discloses (refer to figure 7) wherein a primary mirror (20) is elliptical (column 12, line 61).

Regarding claim 6, Kiunke et al discloses, wherein a primary mirror (20) is spherical (column 2, lines 64 - 66).

Regarding claim 7, Kiunke et al discloses (refer to figure 1) wherein a secondary mirror (22) is convex (column 2, lines 66 – 68).

Regarding claim 8, Kiunke et al discloses (refer to figure 1) wherein a secondary mirror (22) is parabolic.

Regarding claim 9, Kiunke et al discloses (refer to figure 1) wherein a secondary mirror (22) is hyperbolic.

Regarding claim 10, Kiunke et al discloses, wherein a secondary mirror (22) is elliptical (column 12, line 61).

Regarding claim 11, Kiunke et al discloses, wherein a secondary mirror (22) is spherical (column 2, lines 64 - 66).

Regarding claim 16, Kiunke et al discloses, a first detector (i.e., a detector array 21) operable to detect a first range of wavelengths (column 2, lines 56 – 57).

Regarding claim 17, Kiunke et al discloses, a second detector (i.e., a detector array 21) operable to detect a second range of wavelengths (column 2, lines 56 – 57).

Regarding claim 19, Kiunke et al discloses, wherein a second fold mirror (28) is transparent to a desired infrared wavelength (column 2, lines 62 – 63).

Regarding claim 20, Kiunke et al discloses (refer to figure 1) a first infrared detector (i.e., a detector array 21) to receive infrared light through a second fold mirror

(28) (column 2, lines 56 – 63). Kiunke et al discloses all of the claimed limitations except a detector positioned within sphere. However, Cooper discloses a spherical housing (1) (i.e., sphere shape, spherical envelope is less than .15 inch or 1.7 percent of the sphere radius) (column 3, lines 19 – 25, column 5, lines 20 – 30).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a spherical housing (1) with the sphere shape in to the Kiunke an imaging system for the purpose of minimizes the size, weight, and to achieve an extremely good aerodynamic characteristics as taught by Cooper (column 1, lines 60 – 65, column5, lines 29 - 30).

Regarding claim 21, Kiunke et al discloses, wherein first infrared detector (21) further includes a focal plane array (column 12, lines 42 – 46).

Regarding claim 35, Kiunke et al discloses (refer to figures 4 - 7) an illumination and detection system (10) comprising: a folded imaging system having primary and secondary mirrors (20 and 22) and two or more fold mirrors (26 and 28) and a first laser (90) illumination system (column 11, lines 31 – 65, column 12, line 46). Kiunke et al discloses all of the claimed limitations except a spherical housing. However, Cooper discloses (refer to figure 1) a spherical housing (1) (column 3, lines 19 – 25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a spherical housing (1) in to the Kiunke an imaging system for the purpose of minimizes the size and weight and to achieve a high resolution with a larger diameter aperture as taught by Cooper (column 1, lines 60 – 65).

Regarding claim 36, Kiunke et al discloses, wherein the first laser (90) illumination system is operable to produce an output with a first range of wavelengths (column 12, lines 46 – 48).

***Allowable Subject Matter***

4. Claims 42 – 45 are allowed.
5. The following is an examiner's statement of reasons for allowance: The prior art taken either singularly or in a combination fails to anticipate or fairly suggest the limitations of the independent claims, in such a manner that rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claim features as presented in independent claim 42, for example, which include an imaging system adapted to fit within a spherical housing and imaging system having a beamsplitter in the spherical housing to receive an input from a fold mirror and placing two or more field correctors in the spherical housing .
6. Claims 12 – 15, 18, 22 – 34, 37 – 41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
7. The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to show, a beamsplitter, a second beam splitter, system has f – number of between about f/3 to about f/8, a ratio of diameter of primary mirror to a diameter of ball is about 11/20, a ratio of diameter of primary mirror to a diameter of ball

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is about 9/10, a field corrector, a MWIR to LWIR camera having a FPA, a dewar, and a cold stop, a wide field of view (WFOV) acquisition camera disposed within a central obscuration of secondary within a spherical housing, range of wavelengths is centered at about 1 micron, and a spherically- enclosed folded imaging system further comprises a MWIR or LWIR channel.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The closest prior art

Albert et al discloses a gyro seeker which may be employed and housed in the nose section of a cannon lunched missile.

Cooper (5,936,771) discloses a compact FLIR optical configuration.

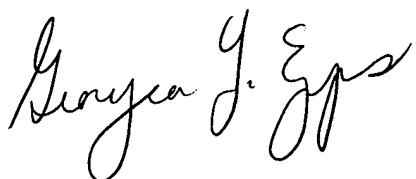
### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohammed Hasan whose telephone number is (571) 272-2331. The examiner can normally be reached on M-TH, 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on (571) 272- 2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MH  
March 16, 2005



Georgia Epps  
Supervisory Patent Examiner  
Technology Center 2800